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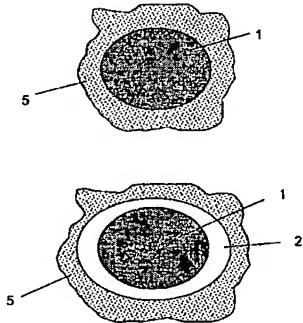
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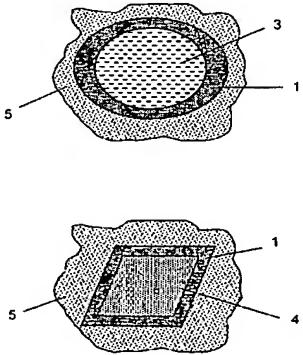
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- (71) Applicant (*for all designated States except US*): **PSIMEI PHARMACEUTICALS PLC [GB/GB]; 13-21 High Street, Guildford, Surrey GU1 3DG (GB)**
- (72) Inventor; and
- (75) Inventor/Applicant (*for US only*): **PATEL, Bipin, Chandra, Muljibhai [GB/GB]; Psimei Pharmaceuticals plc, 13-21 High Street, Guildford, Surrey GU1 3DG (GB).**
- (74) Agent: **CORNISH, Kristina, Victoria, Joy; Kilburn & Strode, 20 Red Lion Street, London WC1R 4PJ (GB).**
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(54) Title: **DELIVERY OF NEUTRON CAPTURE ELEMENTS FOR NEUTRON CAPTURE THERAPY**



(57) Abstract: Neutron capture therapy (NCT) for example, Boron neutron capture therapy (BNCT) requires the delivery of a neutron capture element such as Boron to a target site to be treated, followed by irradiation with neutrons. The invention provides new means for delivery of the neutron capture element in the form of insoluble inorganic nanoparticles having a particle size of about  $10^{-10}$ m to about  $10^{-6}$ m. The neutron capture element can be in particulate form or in the form of glass or glass ceramic or as a polymerised inorganic matrix or as a sol-gel derived xerogel. The nanoparticles of the invention can further comprise a biocompatible outer layer which provides the function of stealth and assists in providing an appropriate clearance rate. In some embodiments, the nanoparticles comprise a core selected from, for example, mica, zeolites,  $TiO_2$  spheres,  $ZrO_2$  spheres or particles or organic polymer particles or spheres surrounded by a thin film of the neutron capture element. Pharmaceutical compositions, uses and methods for the treatment of cancer are disclosed. Also disclosed is a process for the preparation of water insoluble nanoparticles comprising causing friction between pure blocks of the required neutron capture element in an inorganic form and collecting nanoparticles that result therefrom.



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